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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/737,412

12/15/2003

Kwun-Yao Ho

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05/26/2006

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EXAMINER

NGUYEN, HOA CAO

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/737,412	Applicant(s) HO ET AL.	
	Examiner Hoa C. Nguyen	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17, 18 and 20-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 18 and 20-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 3/15/06 has been entered. Applicants have amended the independent claim 17 and cancelled claims 1-16 and 19. Claims 17-18 and 20-24 are considered in this Office action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 17-18 and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Bindra et al. (US 5129142).

Regarding claim 17, as shown in figures 3A-3C, Bindra et al. disclose a multi-layered substrate, at least comprising:

(a) A lamination structure 4 (dielectric layers, conventionally laminated - col.4:55-col.5:2 and col.5:14-16) having at least a through-hole 8 (open vias, col.5:24-25), wherein the through-hole passes through and links up with the surfaces (as shown) of the lamination structure:

(b) a first mask layer 1 (photosensitive layer, col.5:10-11) formed on one surface of the lamination structure, wherein the first mask layer has at least a first opening (no number, top opening, figure 2C);

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(c) a second mask layer 1 (same reference number) formed on another surface of the lamination structure, wherein the second mask layer has at least a second opening (bottom opening, figure 2C); and

(d) a vertical routing structure (the conductive vias as shown in the figures) comprising a conductive rod 2 (a stud of joint metal, see column 5, lines 40-41) and a conductive layer 9 (a thin electrically continuous metal layer, col.4:34-40 and col.5:31), wherein the conductive rod occupies the interior of the through-hole 8 (as shown in the figures) and the ends of the conductive rod completely fill the first and second opening respectively (fill above the surface, col.5:34-37), and the conductive layer occupies the space between the interior surface of the through-hole and the conductive rod (as shown in the figures), wherein the conductive layer extends to cover a peripheral surface of the second opening and a portion of the second mask layer around the second opening (as shown in figure 3A, the layer 9 covers everywhere on the surface of the interior surface of the opening 8, col.4:34-37).

Regarding claim 18, as clearly shown in the figures, Bindra et al. disclose the second opening has a diameter greater than the through-hole (via 8).

Regarding claim 20, Bindra et al. disclose one end of the conductive rods 2 serves as a bump 7 (contact lands, see column 5, line 35).

Regarding claim 21, Bindra et al. disclose a bump 7 attached to one end of the conductive rod.

Regarding claims 22-23, as shown in figure 3D, Bindra et al. disclose a pre-solder block/solder ball 13 (solder paste or solder ball, see column 5, lines 48-49)

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attached to one end of the conductive rod 2. It is noticed that the land 7 is served as a joint for electrical connection to another substrate or a surface mounting chip, see column 4, line 66 continuing column 5, and line 2.

Regarding claim 24, as shown in figure 1A, Bindra et al. disclose the lamination structure comprising at least a buried circuit layer 5 (signal lines, see column 5, line 16) that connects electrically with the conductive layer. It is noticed that conductive vias are conventionally known to electrically connect signal lines between different layers of a printed circuit board.

Response to Arguments

4. Applicant's arguments filed on 3/15/06 have been fully considered but they are not persuasive. Applicants argue:

(a) Remarks, page 6, lines 2-7: The argument is that the metal layer 9 only covers the inner surface of the vias 8, but not the surface of the lands 7 (cavities) and Bindra does not teach all the limitations of the conductive layer 9.

As clearly shown in figure 3A, layer 9 covers the entire inner surface of through-hole 8 and the surface of the land 7 (see column 4, lines 34-37).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa C. Nguyen whose telephone number is 571-272-8293. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hoa C. Nguyen
5/21/06


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